WHAT IS CLAIMED IS:

1. A method of determining an analyte concentration in a sample, the sample comprising the analyte and a substance, the method comprising:

providing absorption data of the sample;

providing reference absorption data of the substance;

calculating a substance contribution of the absorption data; and

subtracting the substance contribution from the absorption data of the sample, thereby providing corrected absorption data of the analyte substantially free of a contribution from the substance.

2. The method of Claim 1, wherein providing the absorption data of the sample comprises:

providing transmittance data of the sample; and

determining the absorption data from the transmittance data.

3. The method of Claim 2, wherein providing the transmittance data of the sample comprises:

transmitting at least a portion of an infrared signal through the sample, the infrared signal comprising a plurality of wavelengths; and

measuring the portion of the infrared signal transmitted through the sample as a function of wavelength.

4. The method of Claim 3, wherein providing the transmittance data further comprises placing the sample in a cuvette.

5. The method of Claim 2, wherein the sample comprises blood.

6. The method of Claim 5, wherein the analyte comprises glucose, and the selected transmittance wavelength range comprises wavelengths at which the transmittance data is dominated by water transmittance.

7. The method of Claim 2, wherein the sample comprises plasma.

8. The method of Claim 7, wherein the analyte comprises glucose, and the selected transmittance wavelength range comprises wavelengths at which the transmittance data is dominated by water transmittance.

9. The method of Claim 1, wherein calculating the substance contribution comprises:

providing reference substance absorption data;

scaling the reference substance absorption data by multiplying the reference substance absorption data by a scaling factor; and

subtracting the scaled reference substance absorption data from the absorption data, thereby providing the corrected absorption data.

10. The method of Claim 9, wherein the substance comprises water.

11. The method of Claim 9, wherein the substance interferes with determining the analyte concentration.

12. The method of Claim 11, wherein the sample further comprises a second substance which interferes with determining the analyte concentration to a lesser extent than does the substance, the method further comprising calculating a second substance contribution of the absorption data and subtracting the second substance contribution from the absorption data, thereby providing twice-corrected absorption data substantially free of contributions from the substance and from the second substance.

13. The method of Claim 9, wherein the reference substance absorption data is corrected for temperature-dependent effects.

14. The method of Claim 9, wherein the reference substance absorption data is corrected for wavelength-dependent nonlinearities.

15. The method of Claim 14, wherein the sample is contained within a sample element and the wavelength-dependent nonlinearities are generated by scattering from the sample element.

16. The method of Claim 14, wherein the sample is contained within a sample element and the wavelength-dependent nonlinearities are generated by fringing from the sample element.

17. The method of Claim 9, wherein scaling the reference substance absorption data utilizes at least two wavelength ranges.

18. The method of Claim 1, wherein the sample comprises a second substance, and the method further comprises subtracting a second contribution corresponding to the

second substance from the corrected absorption data, thereby providing twice-corrected absorption data substantially free of contributions from the substance and from the second substance.

19. The method of Claim 18, wherein subtracting the second contribution comprises:

providing second reference absorption data corresponding to the second substance;

scaling the second reference absorption data by multiplying the second reference absorption data by a second scaling factor; and

subtracting the scaled second reference absorption data from the corrected absorption data, thereby providing the twice-corrected absorption data.

20. The method of Claim 19, wherein the second substance comprises a whole blood protein.

21. The method of Claim 19, wherein the second substance comprises components of a boundary layer between water and a whole blood protein.

22. The method of Claim 19, wherein the second substance comprises urea or lactate.

23. The method of Claim 18, further comprising fitting the twice-corrected absorption data with analyte spectral data, thereby yielding a measurement of the analyte concentration in the sample.

24. The method of Claim 23, wherein the twice-corrected absorption data is fitted with reference analyte spectral data.

25. A method of providing measurements of constituents in a sample using infrared (IR) spectroscopy, the method comprising:

providing absorption data of the sample; and

correcting the absorption data for a non-analyte contribution to the absorption data.

26. The method of Claim 25, wherein providing absorption data comprises:

placing the sample in a cuvette having a shape;

passing IR radiation through a filter having a finite width;

irradiating the cuvette with the IR radiation; and

detecting a fraction of the IR radiation transmitted through the cuvette and the sample.

27. The method of Claim 26, wherein the non-analyte contribution is from the finite width of the filter.

28. The method of Claim 26, wherein the non-analyte contribution is dependent on the temperature of the sample.

29. The method of Claim 26, wherein the non-analyte contribution is dependent on the temperature of the filter.

30. The method of Claim 26, wherein the non-analyte contribution is from the shape of the cuvette.

31. The method of Claim 25, wherein the sample comprises blood.

32. The method of Claim 25, wherein the sample comprises plasma.

33. A method of using infrared (IR) spectroscopy to determine a ratio of an analyte volume to the total volume of a sample comprising the analyte, a first substance, and a second substance, the method comprising:

providing absorption data from the sample for a first set of wavelengths in a wavelength region where a first-substance absorption dominates;

calculating a first quantity equal to the product of a first-substance volume concentration and a path length of the sample;

providing absorption data from the sample for a second set of wavelengths in a wavelength region where the first-substance absorption and a second-substance absorption dominate;

calculating a second quantity equal to the product of a second-substance volume concentration and the path length of the sample;

providing absorption data from the sample for a third set of wavelengths in a wavelength region where the first-substance absorption, the second-substance absorption, and an analyte absorption dominate;

calculating a third quantity equal to the product of an analyte volume concentration and the path length of the sample; and

calculating a ratio of the third quantity divided by the sum of the first quantity and the second quantity.

34. The method of Claim 33, wherein the analyte comprises glucose.

35. The method of Claim 33, wherein the first substance comprises water.

36. The method of Claim 33, wherein the second substance comprises hemocrit.

37. The method of Claim 33, wherein the second substance comprises hemoglobin.

38. The method of Claim 33, wherein the second substance comprises red blood cells.

39. A method of determining non-analyte contributions to absorption data from a sample, the method comprising:

(a) inputting transmission measurements, filter parameters, and water spectral properties;

(b) calculating optical densities and filter constants;

(c) estimating non-linear filter terms and cuvette distortion matrix elements;

(d) solving for a temperature change as a function of the path length; and

(e) calculating new estimates of absorption and non-linear terms.

40. The method of Claim 39, further comprising repeating (d) and (e) until the solution converges to a desired accuracy.

41. The method of Claim 39, wherein the sample comprises blood.

42. The method of Claim 39, wherein the sample comprises plasma.

43. A method of determining non-analyte contributions to absorption data from a sample, the method comprising:

(a) inputting transmission measurements, filter parameters, and water spectral properties;

(b) calculating optical densities and filter constants;

(c) estimating non-linear filter terms and cuvette distortion matrix elements;

(d) solving for a temperature change as a function of the path length; and

(e) calculating new estimates of absorption and non-linear terms.

44. The method of Claim 43, further comprising repeating (d) and (e) until the solution converges to a desired accuracy.

45. A method of evaluating analyte concentration errors in absorption data from a sample, the method comprising:

calculating transmission and optical densities at four wavelengths for a water-filled cuvette, the four wavelengths comprising two wavelengths dominated by absorption by water, an analyte reference wavelength, and a measurement wavelength;

using the optical densities to determine the water content at the analyte reference wavelength and the measurement wavelength;

calculating expected optical density values at the analyte reference wavelength and the measurement wavelength;

calculating residuals between the exact and calculated optical densities at the analyte reference wavelength and the measurement wavelength; and

determining the analyte concentration error by calculating the analyte concentration consistent with the difference between the residuals at the analyte reference wavelength and the measurement wavelength.

46. The method of Claim 45, wherein the sample comprises blood.

47. The method of Claim 45, wherein the sample comprises plasma.

48. The method of Claim 45, wherein the analyte comprises glucose.

49. A method of determining an optical pathlength of a sample comprising water and a whole blood protein, the method comprising measuring an optical absorption of the sample at an isosbestic wavelength and calculating the optical pathlength of the sample from the optical absorption.